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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/678,981	10/03/2003	Naoki Hanashima	890050.441	1539
500	7590	10/07/2005		
SEED INTELLECTUAL PROPERTY LAW GROUP PLLC 701 FIFTH AVE SUITE 6300 SEATTLE, WA 98104-7092				
			EXAMINER PENG, CHARLIE YU	
			ART UNIT 2883	PAPER NUMBER

DATE MAILED: 10/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary	Application No.		Applicant(s)	
	10/678,981		HANASHIMA ET AL.	
	Examiner		Art Unit	
	Charlie Peng		2883	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) 26-38 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-12, 17-25 and 39 is/are rejected.
- 7) ☒ Claim(s) 13-16 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 July 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) ☒ Notice of References Cited (PTO-892) | 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) ☐ Notice of Informal Patent Application (PTO-152) |
| 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) ☐ Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 112

Claim 1 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In amended claim 1, an added limitation "the extension of the first core having the same surface smoothness as the first core" is not found in the specification at the time the application was filed and is added as new matter. The limitation is therefore not considered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. §102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-12 are rejected under 35 U.S.C. §102(b) as being anticipated by "Efficient coupling of a semiconductor laser to an optical fiber by means of a tapered waveguide on silicon" by Shani et al. Shani teaches, in **Fig. 1** and **paragraphs 2-3**, a first optical waveguide that is the tight mode waveguide with a tight mode core and a

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phosphorsilicate glass cladding, a second optical waveguide that is the loose mode waveguide with a loose mode core of phosphorsilicate glass core (extension to tight mode cladding), and a transition waveguide that is the taper between the first and second optical waveguide and tapers towards the second optical waveguide.

Referring to claims 2-3 and 7-9, **Fig. 1** clearly shows that both the first and second waveguides are substantially on the same axis, having rectangular cross-sections, and channel-typed, i.e., they both have channel-like cores instead of planar cores.

Referring to claims 4-6 and 10-12, all limitations are clearly taught by **Fig. 1**, with the left and bottom-most line acting as the boundary between a lower cladding and an upper cladding.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. §103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 17-19 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent 6,813,417 to Oh et al. in view of U.S. Patent 5,157,746 to Tobita et al. Oh teaches spot size converter having a first channel-type (EO polymer) waveguide 102 with a first core 102a and a first cladding 102b, a channel-type transition waveguide 106 with a tapered core 106a and a transition cladding 106b as an extension of the first

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cladding 102b, and the transition cladding 106b further extends to become a core of a second channel-type (passive) waveguide 106, wherein the transition waveguide core 106a narrows gradually from the first waveguide to the second waveguide. (See at least Fig. 1 and description) Although Oh does not specifically a second cladding for the second waveguide 106, it is known that a cladding is inherent to any optical waveguides, for example, air can be considered the second cladding here. Oh further teaches optical field mode profiles (distribution) for both the EO (first) and passive (second) waveguides. (See at least Fig. 6 and description) Oh does not teach a method by which a refractive index of the transition waveguide is changed by irradiating energy beam. However, the method is well known and practiced in the art. For example, U.S. Patent 5,157,746 to Tobita et al. teaches such a method comprising a step of forming a waveguide portion in which the refractive index is larger than that of another portion by irradiating the light beams onto the surface of the first material with a constant irradiation energy. It would have been obvious for one having ordinary skill in the art at the time the invention was made to use this method to change the refractive index of the transition waveguide. The motivation would be that using a well known method allows easier manufacturing process and reduces the time needed for further research and development.

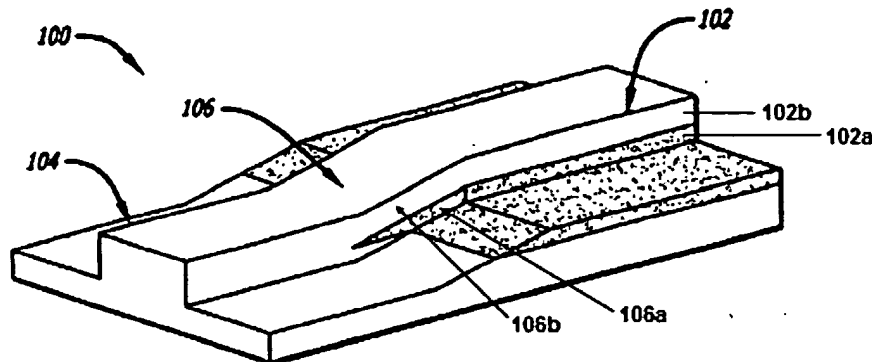


FIG. 1

Claims 20-25 and 39 are rejected under 35 U.S.C. §103(a) as being unpatentable over Oh et al. and Tobita et al. further in view of U.S. Patent 6,718,109 to Bonar et al. Oh and Tobita teach the first, second, and transition waveguides, except for the second cladding having two parts, particular dopants for the second cladding and the first core, and how the dopant(s) change refractive index. Bonar teaches a silica buffer/under-cladding layer 3 (first part), an upper-cladding 8 (second part), wherein the composition of the upper-cladding 8 may be varied by introducing dopants so that it has the same refractive index as the buffer layer 3. (See at least Fig. 2 and description, and column 7, paragraph 3) Although Bonar does not specify the dopants for the upper cladding 8, Bonar teaches how concentration of various dopants including TiO_2 , Al_2O_3 , GeO_2 , P_2O_5 , B_2O_3 , and F change the refractive index, coefficient of expansion, and softening temperature of the doped core or cladding. (See Figs. 3, 4, & 5 and description) Thus it would have been well within ordinary skill to select one of more dopants based on its suitability. (In re Leshin, 125 USPQ 416) In conclusion with regard to claims 20-22, it would have been obvious to one of ordinary skill in the art at the time the invention was

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made to use a two-part cladding. The motivation would be to create waveguides having substantially matching coefficients of thermal expansion and reduce substrate deformation during softening/consolidation.

With specific reference to claims 23 and 24, Bonar teaches a core layer 4 that is silica and GeO_2 that can be further doped with TiO_2 , P_2O_5 , and/or B_2O_3 .

Allowable Subject Matter

Claim 13 is objected to as being dependent upon a rejected base claim 6, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Shani teaches all the limitations of the spot size transformer including the first waveguide, the second waveguide, and the transition waveguide as disclosed by claim 6 except for a particular shape of the first core.

Although other prior art shows a second waveguide with rectangular cross section (see Lam et al. and Nishimura et al.), the structures are fundamentally different as their first core terminate at the edge of the transition waveguide and it is impossible to combine the prior art without destroying the original structures. It is thus the examiner's opinion that the prior art of record, taken alone or in combination, fails to disclose or render obvious in combination with the rest of the limitations of the base claim.

Claim 14-16 are objected to as being directly and indirectly dependent upon an objected to base claim 13, but also would be allowable by virtue of being dependent upon the allowable claim 13.

The indicated allowability of claims 19-25 is withdrawn in view of the newly discovered reference(s) to Oh et al. Rejections based on the newly cited reference(s) can be found in Claim Rejections.

Response to Arguments

With regard to claim 1, applicant's arguments filed 11 July 2005 have been fully considered but they are not persuasive. Applicant apparently argues, with reference to Shani, that for the loose mode core to be considered an extension of the bottom cladding layer, they should be of the same material and/or structure. The examiner disagrees with such a definition. An extension can be defined many different ways and not limited to a part of the same material, for example, the common saying "Tools are extensions of human hands." teaches the extensions (tools) can be separate and different entities. The examiner maintains that the rejection is valid and claim 1 is not allowable.

Applicant's arguments filed 11 July 2005, with respect to claims 17 and 18 have been fully considered and are persuasive. The argument, however, are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charlie Peng whose telephone number is (571) 272-2177. The examiner can normally be reached on 9 am - 6 pm M-F.

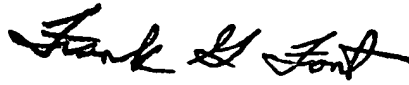
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Charlie Feng
September 22, 2005



Frank G. Font
Supervisory Patent Examiner
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